

**Test Outcome:**

Performance Test Cycle 2 – Case Management Login, Query (search), Create Users and Annual Submission scripts were run to resolve issues encountered in Cycle 1 and introduce new business processes.

**Application Background:**

This eZ-Audit initiative is designed to provide a paperless, single-point of receipt and access for financial statements and compliance audits for institutions participating in Student Financial Aid Title IV programs. The Electronic Audited Financial Statements (EAFS) & Compliance Reports application will reduce the cycle-time required to collect and process financial statements and compliance audits from more than 8,500 proprietary, non-profit, and public institutions. The application will enhance the ability of Case Teams and the Document Receipt and Control Center (DRCC) to accurately record and report status of school reporting; therefore, addressing concerns listed in a recent GAO audit. The quality of FSA service to institutions will also be improved by this application via the timely acceptance and processing of the audited financial statements and compliance reports. This initiative will focus on both FSA audits and Office of Management and Budget (OMB) Circular A-133 audits (both compliance and financial).

**Cycle Background:**

eZ-Audit Performance Test Cycle 2 was executed on March 4, 2003. The goals for this test cycle were to slowly ramp up the number of users in 50 user increments to observe the application's behavior at the designated levels, resolve issues that occurred in Cycle 1, test additional business processes, and test for potential environment and code issues.

**Hardware and Configuration:**

The configuration for the test was one-web server and one application server architecture. The web server is SU35E6 with 4 CPUs and 2GB Memory. The application server is SU35E11 with 4 CPUs and 2 GB Memory and one clone. The configuration featured two Oracle databases, a default WAS session database and EZPRF database.

**Detailed Description:**

Several trials were executed during this test. In the first trial, response time in general was high. The action servlet was at 180 seconds. In preparation for Cycle II test, 300 annual submissions were submitted in the co-team lead's work queue. All these submissions were retrieved when logging on as a case team lead. The cause of long response time in both the Action Servlet and the database was due to the unreasonable size of the queue. The application team indicated that concurrent Case team lead logins should be changed to 2 per team.

After removal, there were 78 annual submissions in the Case team lead's queue for the second trial. Response time for the Action Servlet dropped down to 8 seconds when at below 50 users. When the load was increased beyond 50 users, response time on the Action Servlet started to increase steadily. The test was stopped to apply an eFix on WAS from IBM. The eFix allows custom tags such as Struts JSP tags to work better with WAS.

After eFix was applied, Annual Submission business process was tested. However, due to time constraint, the test ended without completing the trial.

Troubleshooting effort continued after the end of cycle II test. Several aspects of the application were tested.

First, 75 institution users were loaded to perform annual submission for an hour. Response time on the pages was below 4 seconds per page. No exceptions noted in the logs.

Second, after removing the annual submissions off the Case team lead's work queue, troubleshooting shifted back to the long response time on the Action Servlet and JSPs when running Case team lead related business processes. It was found that Case team lead sign-in step took approximately 40 seconds.

Third, as a comparison, a test on the Institution user login was conducted. It was found that the response time held flat below 3 seconds at 100 users load. Contrast to Case-team lead login, response time increased steadily well into the hundred seconds range at 100 users load.

Fourth, based on the above tests and the fact that database response time was at acceptable time frame (in the sub second range), the focus on determining the cause turned toward the Case team lead login process. The application team indicated that the login process retrieved all submissions in the work queue and for each submission; a list of assignees was generated for it. Thus, with a large queue, the rendering of this JSP (co\_team\_lead\_home.jsp) took a significant time.

Fifth, to reinforce the above theory, two additional tests were run. In test A, the script logged in as a Case team lead who did not have any submissions in the work queue. The test showed that response time was under 5 seconds and stayed flat. For test B, the JSP code that generated the list of assignees was commented out so this portion of the logic would not run when logging in. The test showed that the response time was under 8 seconds, and also stayed flat.

From the two tests above, it is believed that the rendering of co\_team\_lead\_home.jsp played a major role in the long response time experienced in cycle II. The problem amplifies when numerous Case team leads try to login with a large number of submissions in the work queue. Two alternatives need to be considered for the next test: is there any other

ways to display Case team lead work queue that could reduce the JSP rendering time; and is the current testing scenario a valid representation of the real world usage. The ITA and the application team will hold a meeting to answer these two questions.

## Annual submission process



### Analysis Summary

Period: 04/03/2003 13:10:41 - 04/03/2003 14:00:00

**Scenario Name:** C:\Program Files\Mercury Interactive\LoadRunner\scenario\ezAudit\0304\_S03.lrs  
**Results in session:** M:\ezAudit\0304\_s08\_trial5\0304\_s08.lrr.  
**Duration:** 1 hour, 7 minutes and 21 seconds.

#### Statistics Summary

- Maximum Running Vusers: 75
- Total Throughput (bytes): 633,915,671
- Throughput (bytes/second): Average: 156,871
- Total Hits: 169,398
- Hits per Second: Average: 41.92 [View HTTP Responses Summary](#)

#### Transaction Summary

[Transactions:](#) Total passed: 7,984 Total failed: 14 Total Stopped: 0

Transaction Name	Minimum	Average	Maximum	90 Percent	Pass	Fail	S
S03_01_EnterHomePage	0.344	0.4	1.359	0.431	450	0	0
S03_02_Login	1.797	1.942	3.031	2.03	444	6	0
S03_03_EnterAnnualSubPage	0.344	0.453	1.922	0.491	444	0	0
S03_04_EnterBalanceSheet	0.234	0.326	1.375	0.371	444	0	0
S03_05_CalculateBalanceSheet	0.266	0.339	1.172	0.401	443	1	0
S03_06_EnterStatementOfActivites	0.281	0.418	1.5	0.491	443	0	0
S03_07_CalculateStatementOfActivities	0.219	0.301	1.547	0.32	443	0	0
S03_08_EnterCashFlowStatement	0.125	0.245	0.547	0.32	443	0	0
S03_09_CalculateCashFlowStatement	0.188	0.262	1.141	0.29	443	0	0
S03_10_EnterAnnualSubPage	0.219	0.335	1.406	0.401	443	0	0

S03_11_EnterCheckListPage	0.313	0.476	1.375	0.521	443	0	0
S03_12_EnterFileUploadPage	0.328	0.45	1.531	0.491	443	0	0
S03_13_ViewHelpPage	0.266	0.349	1.563	0.421	443	0	0
S03_14_UploadFile	0.734	0.825	1.844	0.854	443	0	0
S03_15_ViewSubmitMessage	0.125	0.215	1.078	0.29	443	0	0
S03_16_Submit	1.719	1.931	3.063	2.01	443	0	0
S03_17_Logout	0.031	0.056	0.313	0.07	443	0	0
S03_AnnualSubmission	329.063	329.97	331.625	330.607	443	7	0

#### HTTP Responses Summary

HTTP Responses	Total	Per second
HTTP_200	165,853	41.043
HTTP_302	3,544	0.877
HTTP_500	1	0

## Search, Case Team, Create Users



### Analysis Summary

Period: 04/03/2003 10:29:40 - 04/03/2003

**Scenario Name:** C:\Program Files\Mercury  
Interactive\LoadRunner\scenario\ezAudit\0304\_S08\_S10\_S11.lrs  
**Results in session:** M:\ezAudit\0304\_s08\_s10\_s11\_trial2\0304\_s08\_s10\_s11\_trial2.lrr.  
**Duration:** 51 minutes and 30 seconds.

#### Statistics Summary

**Maximum Running Vusers:** 150  
 **Total Throughput (bytes):** 770,738,893  
 **Throughput (bytes/second):** Average:  
249,430  
 **Total Hits:** 93,721  
 **Hits per Second:** Average: 30.33 [View HTTP Responses Summary](#)

#### Transaction Summary

[Transactions:](#) Total passed: 6,238 Total failed: 2 Total Stopped: 289

Transaction Name	Minimum	Average	Maximum	90 Percent	Pass	Fail	Std
S08_01_EnterHomePage	0.344	22.821	80.297	59.07	839	0	11
S08_02_Login	2.438	78.609	180.469	151.873	807	0	32
S08_03_Logout	0.031	24.672	78.781	66.342	786	0	21
S08_CaseTeamLogin	8.953	128.38	303.156	268.339	786	0	64
S10_01_EnterHomePage	0.141	31.274	78.344	67.326	384	0	7
S10_02_Login	2.578	96.572	177.672	155.041	365	0	18
S10_03_EnterSearchPage	0.172	34.694	81.813	70.808	356	0	9
S10_04_Search	0.859	36.158	82.328	70.297	340	0	14
S10_05_Logout	0.047	32.605	80.141	67.109	332	0	8
S10_Query	16.156	231.315	418.813	399.441	332	0	59

S11_01_EnterHomePage	0.344	11.857	67.594	58.119	43	0	0
S11_02_Login	3.188	60.527	180.656	154.073	43	0	0
S11_03_EnterManageUserPage	4.438	51.837	138.563	116.682	42	0	1
S11_04_EnterAddUserPage	0.531	17.519	72.734	57.44	41	0	1
S11_05_AddUser	4.531	60.147	143.344	132.23	40	1	0
S11_06_EnterDeletionPage	1.438	35.004	99.078	89.339	40	0	0
S11_07_CancelDeletion	2.891	53.279	149.469	124.961	39	0	1
S11_08_GoToNextPage1	3.109	55.808	136.453	128.065	39	0	0
S11_09_GoToNextPage2	1.969	55.439	152.813	126.474	424	0	17
S11_13_SelectUserToDelete	3.156	29.099	110.922	93.608	22	0	0
S11_14_DeleteUser	4.219	38.554	117.469	100.484	21	0	1
S11_15_SelectByName	0.703	11.61	70.516	46.079	20	0	1
S11_16_ReturnToFirstPage	4.297	41.561	135.047	108.249	20	0	0
S11_17_SelectByUserName	0.688	13.615	81.984	70.706	20	0	0
S11_18_UpdateEmail	5.078	39.803	126.828	100.204	19	0	1
S11_19_Logout	0.078	7.008	77.375	48.435	19	0	0
S11_CreateUser	131.891	609.666	1,617.859	1,383.76	19	1	23

#### HTTP Responses Summary

HTTP Responses	Total	Per second
HTTP_200	93,721	30.33